



THE U.S. EPA's DESIGN FOR THE ENVIRONMENT (DfE) PROGRAM

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What is the Design for the Environment (DfE)

Program? In the early 1990s manufacturers started thinking in terms of “design for” qualities or traits in their products and processes. At the same time views on risk management were shifting to approaches that promote risk reduction through pollution prevention (source reduction). EPA recognized the need to develop a Cleaner, Safer Technologies Program to work with industry to design products, processes and technologies with competitiveness and the environment in mind. Several non-regulatory, voluntary initiatives on safer chemical synthesis, comparative risk analysis, and alternative technology development were merged to create the EPA’s Design for the Environment (DfE) Program.

The DfE Program is a voluntary partnership-based program that works directly with companies to integrate health and environmental considerations in business decisions.

The DfE Approach: The DfE Program is a testing ground for new approaches to risk reduction through pollution prevention. DfE serves as a catalyst for lasting change that balances business practicalities with sound environmental decision-making. The DfE approach is grounded in comparing performance, costs, and the risks associated with alternatives. DfE also strongly supports the “Pollution Prevention Principles.” That is, a goal of DfE is to encourage pollution prevention, front-end, innovations through redesign rather than relying on end-of-pipe controls to reducing potential risks to human health and the environment. A DfE solution may focus on the redesign of a formulation, a shop floor process, a manufacturing or formulation process, a disposal practice or, a management practice.

The DfE approach uses cleaner technologies substitutes assessments (CTSAs) and life cycle tools to evaluate the performance, costs, and environmental and human health impacts of competing technologies. A CTSA is a compilation of considerations and reference materials related to available and emerging technology in a given industrial sector and serves as a guide for decision-makers.

DfE Partnerships: The DfE Program partners with an entire industry sector through industry leaders and trade association representatives. The results of a DfE assessment are disseminated throughout the industry so business decision-makers can make more informed decisions that result in reduced risks and environmental burdens while improving efficiency and the bottom-line. The following is a brief snapshot of the current DfE Partnerships:

DfE Printing Projects: DfE Printing Partnerships have been forged with three sectors of the printing industry: screen printing, lithography, and flexography. The Screen Printing Project evaluated 18 screen reclamation technologies; the Lithography Project assessed 37 blanket wash formulations; and the Flexography Project is comparing solvent, water, and UV ink technologies. ***For more information, contact Karen Doerschug at 202-260-0695.***

DfE Electronics Projects: The printed wiring board (PWB) manufacturing process requires the use of substantial amounts of water, energy, and some toxic chemicals that pose potential environmental and health risks. The DfE Partnership collaborated on a CTSA for the “making holes conductive” step of PWB manufacturing. The Printed Wiring Board partnership is now conducting a second CTSA to evaluate the risk, performance, and cost of several lead-free surface alternatives to the standard hot air solder leveling process. The DfE Program has also formed a partnership with the computer display industry. The Computer Display Project will use both life-cycle assessment and CTSA methodologies to evaluate and compare the environmental impacts, performance, and cost of cathode ray tube (CRT) and flat panel display (FPD) technologies that can be used in the desktop computers. ***For more information, contact Kathy Hart at 202-260-1707 or Dipti Singh at 202-260-3436.***

Garment and Textile Care Program: DfE has been working in partnership with the dry cleaning industry to reduce exposure to perchloroethylene or “perc.” Perc, a chemical solvent used by most dry cleaners, poses health

and environmental concerns. The DfE Dry Cleaning Project, which historically focused primarily on dry cleaning is expanding into a broader DfE Garment and Textile Care Project (GTCP). GTCP is envisioned as a collaborative partnership involving industrial supply chain (raw material) providers. Strategy shall include examining alternative technologies for garment and textile care, textile and clothes design and manufacture, garment construction, care labels, outreach and education. ***For more information, contact Cindy Stroup at 202-260-3889.***

Industrial/Institutional Laundry Partnership Initiative: Formulators in the Industrial/Institutional Laundry Project are encouraged to design and adopt safer and more efficient cleaning products. DfE recognizes innovations that reduce impacts to human health and the environment. Proposed partnerships are evaluated on the following considerations: use of ingredients that pose less concern to the environment or human health; ability to aid compliance with existing regulatory requirements; potential to achieve other environmental benefits such as reduced resource consumption; nature of a company's willingness to furnish measures of success. Benefits to companies forming a partnership include technical information and advice on the environmental aspects of formulations and recognition of product and process improvements. ***For more information, contact David DiFiore at 202-260-3374.***

Auto Refinishing Project: The DfE Program is working with auto refinishers to identify and adopt safer, cleaner, and more efficient practices and technologies. Auto refinishers use many harmful chemicals, especially during painting operations; among them, diisocyanates, solvents and paint additives. The DfE Auto Refinishing Project is identifying better control technologies to reduce worker exposures, more efficient workplace practices, and practical ways to adapt new technologies to the real-world parameters of the small shop. A pilot study is underway with a number of small shops to identify areas of improvement and incentives for changes. ***For more information, contact Mary Cushmac at 202-260-4443.***

Supplier Initiative: Manufacturers of complex products such as automobiles, appliances, ships and aircraft depend on a broad network of suppliers for parts and assemblies. Many of the suppliers in these supply chains (or tiers), are small and medium size businesses specializing in manufacturing operations. The DfE Program is exploring how to utilize these networks to promote the reduction of exposures and risks in these small facilities. Case studies are being developed to share available risk reduction methods. ***For more information, contact John Sparks at 202-260-1682.***

Wall Paints: EPA and industry stakeholders, including paint manufacturers and suppliers, are working to develop an

alkyd and latex wall paint exposure tool. ***For more information, contact Christina Cinalli at 202-260-3913.***

Adhesives in the Foam Furniture and Sleep Products

Industries: Regulatory requirements are causing rapid changes in adhesive solvent use. The industry's concern is that affordable, effective and safe adhesives will not be readily available. Alternative solvents and processes will be investigated with the goal of mitigating impacts posed by chlorinated and flammable solvents currently used. ***For more information, contact John Sparks at 202-260-1682.***

DfE-PETE Education Alliance: The DfE Program joined forces with the Partnership for the Environmental Technology Education (PETE) to form the DfE-PETE Alliance. PETE is a nonprofit organization established to promote environmental technology education through curriculum development and professional development training for environmental educators. The DfE-PETE Alliance is incorporating risk reduction, DfE methodologies, and pollution prevention information into the curricula of community and technical colleges nationwide. ***For more information, contact Marla Hendriksson at 202-260-8301.***

DfE Approaches to Developing an Environmental Management System (EMS):

The DfE Program has integrated the DfE pollution prevention and risk reduction approaches and methodologies into an Environmental Management System (EMS) framework. DfE is partnering with the Screen Printer's trade association to pilot the first DfE-EMS in small print shops across the country.

To learn more about the Design for the Environment Program, visit the DfE web site at www.epa.gov/dfe or contact Marla Hendriksson, the DfE Communications Manager, at 202-260-8301.

To discuss joining a DfE Partnership Team for any of the DfE Projects described above, please contact the appropriate DfE Project Manager identified. The DfE Program looks forward to welcoming you as a new partner. DfE also welcomes your ideas on new projects using the DfE approach to cleaner, safer technologies. Please contact Bill Hanson, Director of the DfE Program, at 202-260-1678 with your suggestions, or write to:

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